Amendments to the Claims

The following Listing of Claims replaces all prior versions, and listings, of claims in the application.

Listing of Claims:

Claim 1 (currently amended): An optical navigation system, comprising:

a first light source ~~for providing~~operable to produce a coherent first light beam for illuminating a target surface ~~a light beam having a first wavelength incident onto a target surface~~;

a ~~coherent~~ second light source operable to produce a second light beam for illuminating the target surface ~~for providing a divergent beam having a second wavelength incident onto said target surface~~;

a first detector operable to produce first optical data in response to receipt of a ~~for receiving a first~~ reflection of ~~said~~ the first light beam from ~~said~~ the target surface; ~~and~~

a second detector operable to produce second optical data in response to receipt of ~~for receiving~~ a ~~second~~ reflection of ~~said~~ the second light~~divergent~~ beam from ~~said~~the target surface ~~to allow determination of the position of said first and said second detector with respect to said target surface from signals generated by said first and second detectors in response to said first and second reflections whereby navigation in three dimensions is enabled~~; and

a processor operable to determine from the first optical data a first displacement measure corresponding to a displacement of a pattern imaged by the first detector, determine from the second optical data a second displacement measure corresponding to a displacement of a pattern imaged by the second detector, and calculate a distance to the target surface from the first and second displacement measures.

Claim 2 (currently amended): The system of ~~Claim~~ claim 1, wherein ~~said second reflection is comprised of a speckle pattern~~the first detector and the second detector define a detector plane, and the processor is operable to calculate a distance between the detector plane and the target surface from the first and second displacement measures.

Claim 3 (currently amended): The system of ~~Claim~~claim 1, further comprising a first lens operable to direct the first light beam onto a first area of the target surface and a second lens operable to direct the second light beam to a second area of the target surface, wherein the first and second areas of the target surface are non-overlapping~~where said coherent source comprises a VCSEL~~.

Claim 4 (currently amended): The system of ~~Claim~~ claim 1, wherein the first light source comprises a laser that produces the first light beam at a first lasing wavelength, and further comprising a first wavelength filter that intercepts the reflection of the first light beam and selectively passes light at the first lasing wavelength to the first~~for passing said second wavelength and disposed with respect to said second~~ detector ~~such that said second detector receives only said second reflection~~.

Claim 5 (currently amended): The system of ~~Claim 1~~claim 4, wherein the second light source comprises a laser that produces the second light beam at a second lasing wavelength and the first wavelength filter blocks light at the second lasing wavelength, and further comprising a second wavelength filter that intercepts the reflection of the second light beam and selectively passes light at the second lasing wavelength to the second detector and blocks light at the first lasing wavelength~~further comprising a focusing lens positioned between said coherent source and said target surface~~.

Claim 6 (currently amended): The system of ~~Claim 1~~claim 4, wherein the second light source comprises a light emitting diode that produces the second light beam~~further comprising a collimating lens positioned between said light source and said target surface~~.

Claim 7 (currently amended): The system of ~~Claim~~ claim 1, further comprising a lightpipe that receives the reflection of the second light beam and guides the received reflection to the~~disposed between said target surface and said~~ second detector ~~to increase the collection efficiency of said second reflection~~.

Claim 8 (currently amended): The system of ~~Claim~~ claim 1, further comprising a collection lens that receives the reflection of the second light beam and directs the received

reflection to the~~disposed between said target surface and said~~ second detector~~ to increase the collection efficiency of said second reflection~~.

Claim 9 (currently amended): The system of ~~Claim~~ claim 1, further comprising a collimating lens positioned between the second light source and the target surface ~~third detector to receive said second reflection~~.

Claim 10 (currently amended): The system of ~~Claim~~ claim 1, wherein ~~said second~~the first detector comprises an array of detector strips separated by ~~alternating with~~ non detector strips, and the processor is operable to determine the first displacement measure by differencing electrical signals produced by respective ones of the detector strips.

Claim 11 (currently amended): An optical navigation system, comprising:

a coherent light source operable to illuminate a target surface with ~~for providing~~ a coherent first ~~portion of a~~light beam comprising a first wavelength and a coherent second ~~portion of a~~light beam comprising a second wavelength ~~onto a target surface, wherein said target surface is not required to have a pattern~~;

a first detector operable to produce first optical data in response to receipt of~~for receiving~~ a ~~first~~ reflection of ~~said~~the first ~~portion of said~~light beam from ~~said~~the target surface; ~~and~~

a second detector operable to produce second optical data in response to receipt of~~for receiving~~ a ~~second~~ reflection of ~~said~~the second ~~portion of said~~ light beam from ~~said~~ the target surface; and

a processor operable to determine from the first optical data a first displacement measure corresponding to a displacement of a pattern imaged by the first detector, determine from the second optical data a second displacement measure corresponding to a displacement of a pattern imaged by the second detector, and calculate a distance to the target surface from the first and second displacement measures~~to allow determination of the position of said first and said second detector with respect to said target surface from signals generated by said first and second detectors in response to said first and second reflections whereby navigation in three dimensions is enabled~~.

Claim 12 (currently amended): The system of ~~Claim~~ claim 11, wherein ~~said~~ the coherent light source comprises a first narrowband wavelength filter that selectively passes light at the first wavelength while blocking light at the second wavelength to produce the first light beam, and a second narrowband wavelength filter that selectively passes light at the second wavelength while blocking light at the first wavelength to produce ~~said first and~~the second ~~portions of said~~light beam.

Claim 13 (currently amended): The system of ~~Claim~~ claim 11, wherein the first detector and the second detector define a detector plane, and the processor is operable to calculate a distance between the detector plane and the target surface from the first and second displacement measures~~said coherent source comprises a VCSEL~~.

Claim 14 (currently amended): The system of ~~Claim~~ claim 11, further comprising a first lens operable to direct the first light beam onto a first area of the target surface and a second lens operable to direct the second light beam to a second area of the target surface, wherein the first and second areas of the target surface are non-overlapping~~wherein said second reflection is comprised of a speckle pattern~~.

Claim 15 (currently amended): The system of ~~Claim~~ claim 11, further comprising:

a third wavelength filter that intercepts the reflection of the first light beam, selectively passes light at the first wavelength to the first detector, and blocks light at the second wavelength; and

a fourth wavelength filter that intercepts the reflection of the second light beam, selectively passes light at the second wavelength to the second detector, and blocks light at the first wavelength~~a focusing lens operable to focus said second portion of said beam positioned between said coherent and said target surface~~.

Claim 16 (currently amended): The system of ~~Claim~~ claim 11, ~~further comprising~~wherein the light source comprises a focusing lens and a collimating lens, the focusing lens producing the first light beam with a curved wavefront at the target surface, and the collimating lens producing the second light beam with a planar wavefront at the target surface ~~operable to collimate said first portion of said beam~~.

Claim 17 (currently amended): The system of ~~Claim~~ claim 11, further comprising a lightpipe that receives the reflection of the second light beam and guides the received reflection to the second detector~~disposed between said target surface and said second detector to increase the collection efficiency of said second reflection~~.

Claim 18 (currently amended): The system of ~~Claim~~ claim 11, further comprising a collection lens that receives the reflection of the second light beam and directs the received reflection to the second detector~~disposed between said target surface and said second detector to increase the collection efficiency of said second reflection~~.

Claim 19 (currently amended): The system of ~~Claim~~ claim 11~~12~~, wherein the first detector comprises an array of detector strips separated by non detector strips, and the processor is operable to determine the first displacement measure by differencing electrical signals produced by respective ones of the detector strips ~~further comprising a third narrowband wavelength filter for passing said second wavelength and disposed with respect to said second detector such that said second detector receives only said second reflection~~.

Claim 20 (currently amended): The system of ~~Claim~~ claim ~~11~~19, , wherein the second detector comprises an array of detector strips separated by non detector strips, and the processor is operable to determine the second displacement measure by differencing electrical signals produced by respective ones of the detector strips of the second detector~~further comprising a third detector to receive said second reflection~~.

Claim 21 (currently amended): An optical navigation system, comprising:

a coherent light source ~~for providing~~operable to produce a coherent light beam ~~incident onto~~for illuminating a target surface;

a first detector operable to produce first optical data in response to receipt of a first reflection of the coherent light beam~~for receiving a first portion of a reflection of said light beam~~ from ~~said~~ the target surface; ~~and~~

a second detector operable to produce second optical data in response to receipt of a second reflection of the coherent light beam~~for receiving a second portion of said reflection~~

~~of said beam~~ from ~~said~~ the target surface ~~to allow determination of the position of said first and said second detector with respect to said target surface from signals generated by said first and second detectors in response to said first and second reflections whereby navigation in three dimensions is enabled~~; and

a processor operable to determine from the first optical data a first displacement measure corresponding to a displacement of a pattern imaged by the first detector, determine from the second optical data a second displacement measure corresponding to a displacement of a pattern imaged by the second detector, and calculate a distance to the target surface from the first and second displacement measures.

Claim 22 (currently amended): The optical navigation system of ~~Claim~~ claim 21, wherein said coherent light source is ~~positioned~~ configured in relation to the first and second detectors such that when the first and second detectors are parallel to the target surface the coherent light source produces the coherent light beam at an angle of incidence between five and twenty degrees with respect to ~~said~~ an axis orthogonal to the target surface.

Claim 23 (currently amended): The optical navigation system of ~~Claim~~ claim 21, further comprising an aperture ~~positioned between said second~~ that restricts the first detector to a field of view corresponding to a first area of the target surface, and a lens that restricts the second detector to a field of view corresponding to a second area of the target surface, wherein the first and second areas of the target surface are non-overlapping~~and said target surface to limit the field of view of said second detector~~.

Claim 24 (currently amended): The optical navigation system of ~~Claim~~ claim 21, wherein the first detector comprises an array of detector strips separated by non detector strips the second detector comprises a two-dimensional array of photodetectors, and the processor is operable to determine the first displacement measure by differencing electrical signals produced by respective ones of the detector strips of the first detector and to determine the second displacement measure from correlations between images captured by the second detector ~~said first detector is a correlation detector~~.